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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/629,650

07/30/2003

Tsutomu Kadotani

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EXAMINER

DUONG, THOI V

ART UNIT

PAPER NUMBER

2871

MAIL DATE

DELIVERY MODE

12/21/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/629,650

Applicant(s)

KADOTANI, TSUTOMU

Examiner

Thoi V. Duong

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 October 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,5-10 and 21-29 ~~is/are~~ pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1,5-10,21 and 24-26 ~~is/are~~ allowed.
- 6) ☒ Claim(s) 22, 23 and 27-29 ~~is/are~~ rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on October 31, 2007 has been entered.

Accordingly, claims 2-4 and 11-20 were cancelled, and new claims 24-29 were added. Currently, claims 1, 5-10 and 21-29 are pending in this application.

Response to Arguments

2. Applicant's arguments with respect to claim 22 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 22 and 27-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yanagawa et al. (Yanagawa, US 2002/0075442).

Re claim 22, as shown in Figs. 23 and 25, Yanagawa discloses an LCD device comprising:

a first substrate SUB1;
pixels 2 disposed on the first substrate SUB1 (see also Figs. 1 and 2)
(paragraphs 147 and 167);
a second substrate SUB2 coupled to the first substrate SUB1;
a sealing member SL creating a gap between the first substrate and the second
substrate;
a liquid crystal layer disposed in the gap; and spacers SP disposed in the liquid
crystal layer;
wherein the LCD device comprises a display region AR for displaying images
and a non- display region NPSV (non-formation region) which does not display images
(Fig. 23);
wherein the display region AR includes the pixels (Fig. 2);
wherein the non-display region NPSV is disposed between the display region AR
and the sealing member SL (Figs. 23 and 25);
wherein the spacers SP are arranged only in the display region AR and not in the
non-display region NPSV ; and
further comprising a depression formed in protective film PSV in the non-display
region NPSV in order to solve the problem due to bubbles in the liquid crystal
(paragraph 322).

Accordingly, it would have been obvious to one having ordinary skill in the art
that the depression also receives excess liquid crystal coming along with the bubbles

from the liquid crystal layer, wherein the depression is substantially vacant except for the excess liquid crystal (see also Fig. 21).

Since the depression of the non-display region NPSV is used to gather the bubbles from the liquid crystal layer and do not allow the concentrated bubbles to easily travel from the non-display region NPSV (paragraphs 287-291), it is obvious that the gap between the first substrate SUB1 and the second substrate SUB2 is substantially uniform in the display region AR.

Re claim 27, as shown in Fig. 25, the spacers SP comprise a plurality of discrete spacers.

Re claims 28 and 29, as shown in Figs. 1-5, the spacers SP comprises a plurality of discrete spacers arranged in a matrix with a plurality of rows and columns, wherein the spacers SP are pole-shaped.

5. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yanagawa et al. (Yanagawa, US 2002/0075442) in view of Kijima et al. (Kijima, US 6,259,500 B1).

The LCD device of Yanagawa as described above includes all that is recited in claim 23 except for the depression having a height H satisfying a relationship of

$$H \Rightarrow (1/2) \times (1000 + L) \times [0.02d + [L \times (0.02d/1000)]]/L \text{ (micrometer),}$$

when the non-display region has a width L and the gap in the display region has an average value d.

Kijima discloses an LCD device having spacers formed in the display region and none of the spacers being formed in the non-display region (Fig. 8b).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to have the relationship $H \Rightarrow (1/2) \times (1000 + L) \times [0.02d + [L \times (0.02d/1000)]]/L$ satisfied (col. 16, lines 17-46), since one would be motivated to suppress the level of non-uniformity due to variation in cell thickness to an acceptable level so that a convex/concave profile can be provided (col. 16, lines 17-47). Ultimately this serves to help realize a uniform cell thickness across the entire panel and improve display quality (col. 5, lines 7-29).

Allowable Subject Matter

6. Claims 1, 5-10, 21 and 24-26 are allowed.

The following is an examiner's statement of reasons for allowance: none of the prior art of record fairly suggests or shows all of the limitations as claimed. Specifically,

Re claim 1, none of the prior art of record discloses, in combination with other limitations as claimed, an LCD device comprising a depression formed on an inner surface of the first or second substrate, wherein the depression is located in the second part of the liquid-crystal layer corresponding to the non-display region, and the depression constitutes a buffer space which receives extra liquid crystal from the liquid crystal layer; and wherein the depression is substantially vacant except for the extra liquid crystal.

The most relevant reference, US 6,873,391 B2 to Jun et al. (Jun), fails to disclose or suggest that the depression is substantially vacant except for the extra liquid crystal. As shown in Figs. 4-6, Jun discloses a depression 13 formed on an inner surface of the first substrate 1, wherein the depression is located in the non-display

region, and the depression constitutes a buffer space which receives extra liquid crystal from the liquid crystal layer 3 (col. 4, lines 30-49). However, the depression 13 is not substantially vacant except for the extra liquid crystal because of the presence of the ridge 11.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thoi V. Duong whose telephone number is (571) 272-2292. The examiner can normally be reached on Monday-Friday from 8:30 am to 4:30 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms, can be reached at (571) 272-1787.

Thoi V. Duong – Primary Examiner

December 14, 2007

